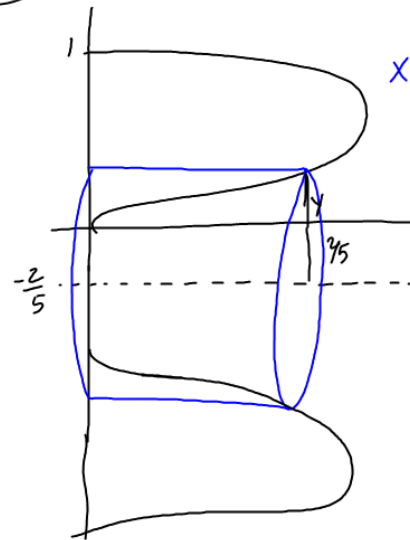


(330)



$$x = 12(y^2 - y^3)$$

$$r = y + \frac{2}{5}$$

$$h = 12(y^2 - y^3)$$

$$\text{depth} = dy$$

$$V_{\text{cyl}} = 2\pi r \cdot h \cdot \text{depth}$$

$$V = 2\pi \int_0^1 \left(y + \frac{2}{5}\right) (12(y^2 - y^3)) dy$$

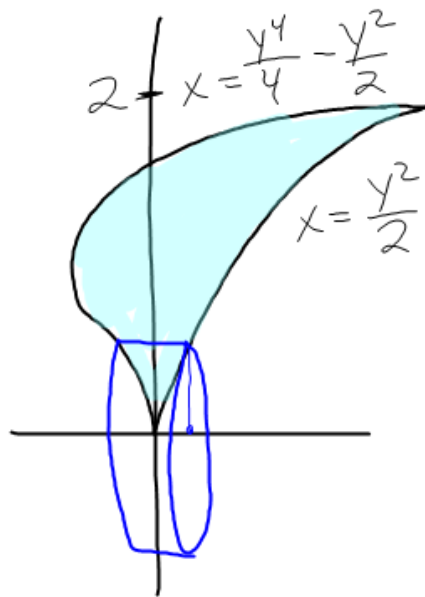
$$V = 24\pi \int_0^1 \left(y^3 - y^4 + \frac{2}{5}y^2 - \frac{2}{5}y^3\right) dy$$

$$V = 24\pi \int_0^1 \left(-y^4 + \frac{3}{5}y^3 + \frac{2}{5}y^2\right) dy$$

$$V = 24\pi \left[-\frac{1}{5}y^5 + \frac{3}{20}y^4 + \frac{2}{15}y^3 \right]_0^1$$

$$V = 24\pi \left[-\frac{1}{5} + \frac{3}{20} + \frac{2}{15} \right] - 0$$

$$\boxed{V = 2\pi}$$



$$r = y$$

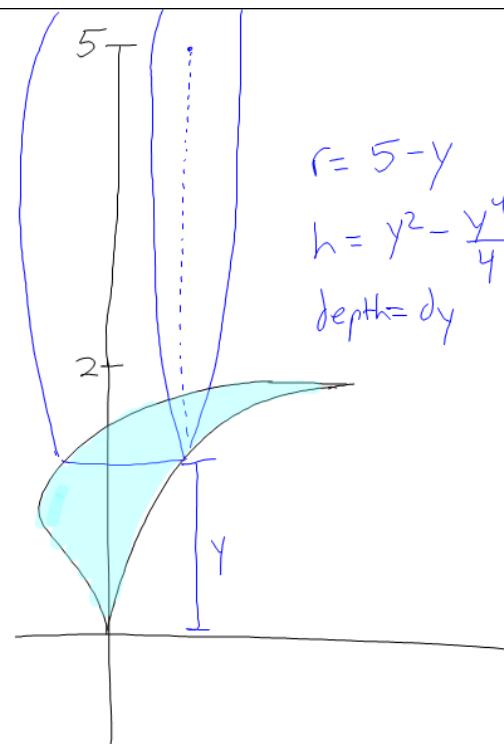
$$h = \frac{y^2}{2} - \left(\frac{y^4}{4} - \frac{y^2}{2} \right) = \frac{y^2}{2} - \frac{y^4}{4} + \frac{y^2}{2} = \boxed{y^2 - \frac{y^4}{4}}$$

$$\text{depth} = dy$$

$$2\pi \int_0^2 \left(y^2 - \frac{y^4}{4} \right) (y) dy = 2\pi \int_0^2 \left(y^3 - \frac{y^5}{4} \right) dy$$

$$= 2\pi \left[\frac{y^4}{4} - \frac{y^6}{24} \right]_0^2$$

$$2\pi \left[\frac{16}{4} - \frac{64}{24} \right] = 2\pi \left[4 - \frac{8}{3} \right] = \left[\frac{4}{3} \right] 2\pi = \boxed{\frac{8\pi}{3}}$$



$$2\pi \int_0^2 \left((5-y) \left(y^2 - \frac{y^4}{4} \right) \right) dy$$

$$2\pi \int_0^2 \left(5y^2 - \frac{5y^4}{4} - y^3 + \frac{y^5}{4} \right) dy$$

$$2\pi \left[\frac{5}{3}y^3 - \frac{y^5}{4} - \frac{1}{4}y^4 + \frac{y^6}{24} \right]_0^2$$

$$2\pi \left[\frac{40}{3} - \frac{32}{4} - \frac{16}{4} + \frac{64}{24} \right]_0^2$$

$$8\pi$$

Thur

- Sect. 7.3

#38, 39, 45-48, 53, 70

Fri

- Test, test (TH)